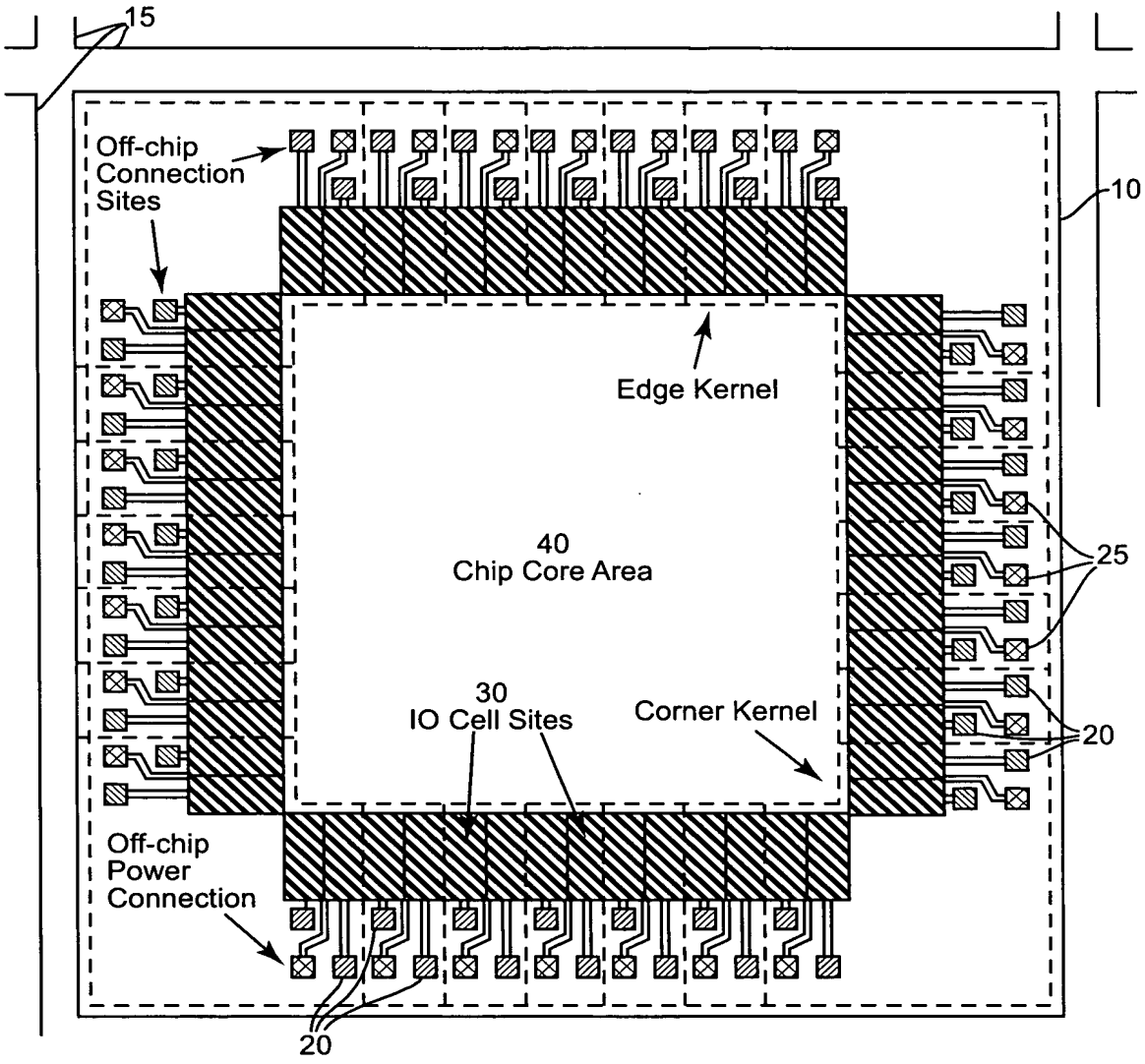

Figure 1
(RELATED ART)

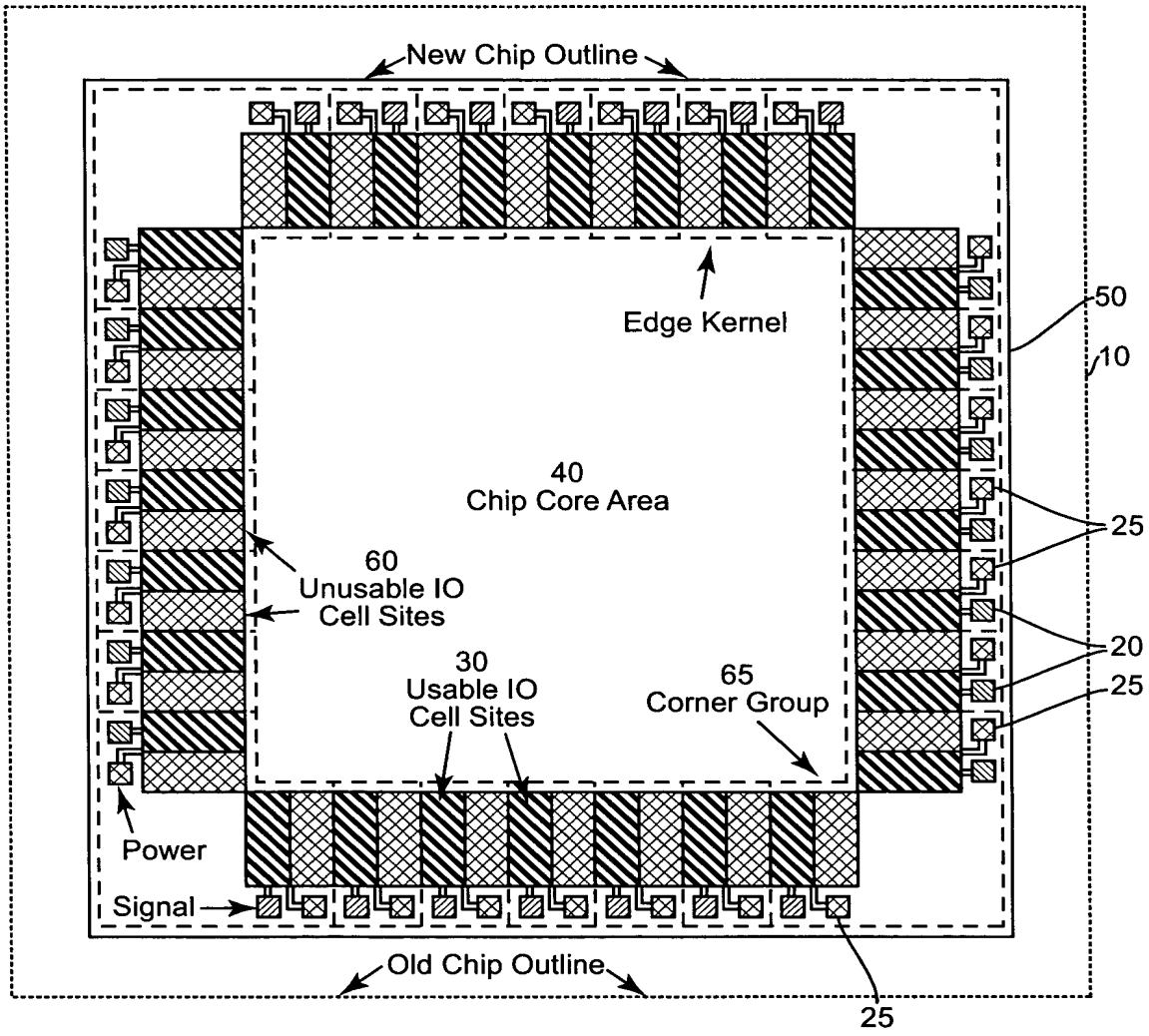

Figure 2
(RELATED ART)

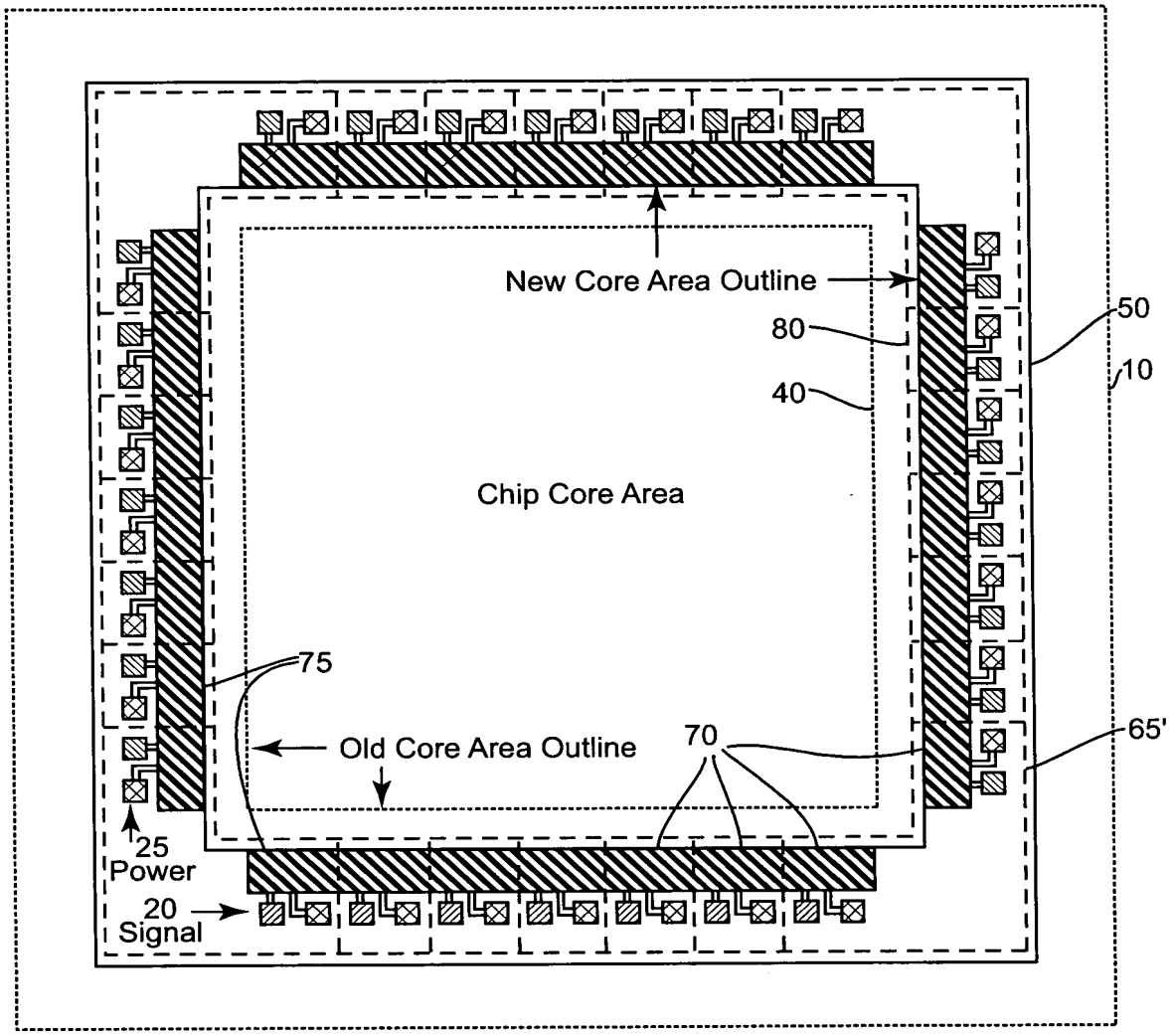

Figure 3
(RELATED ART)

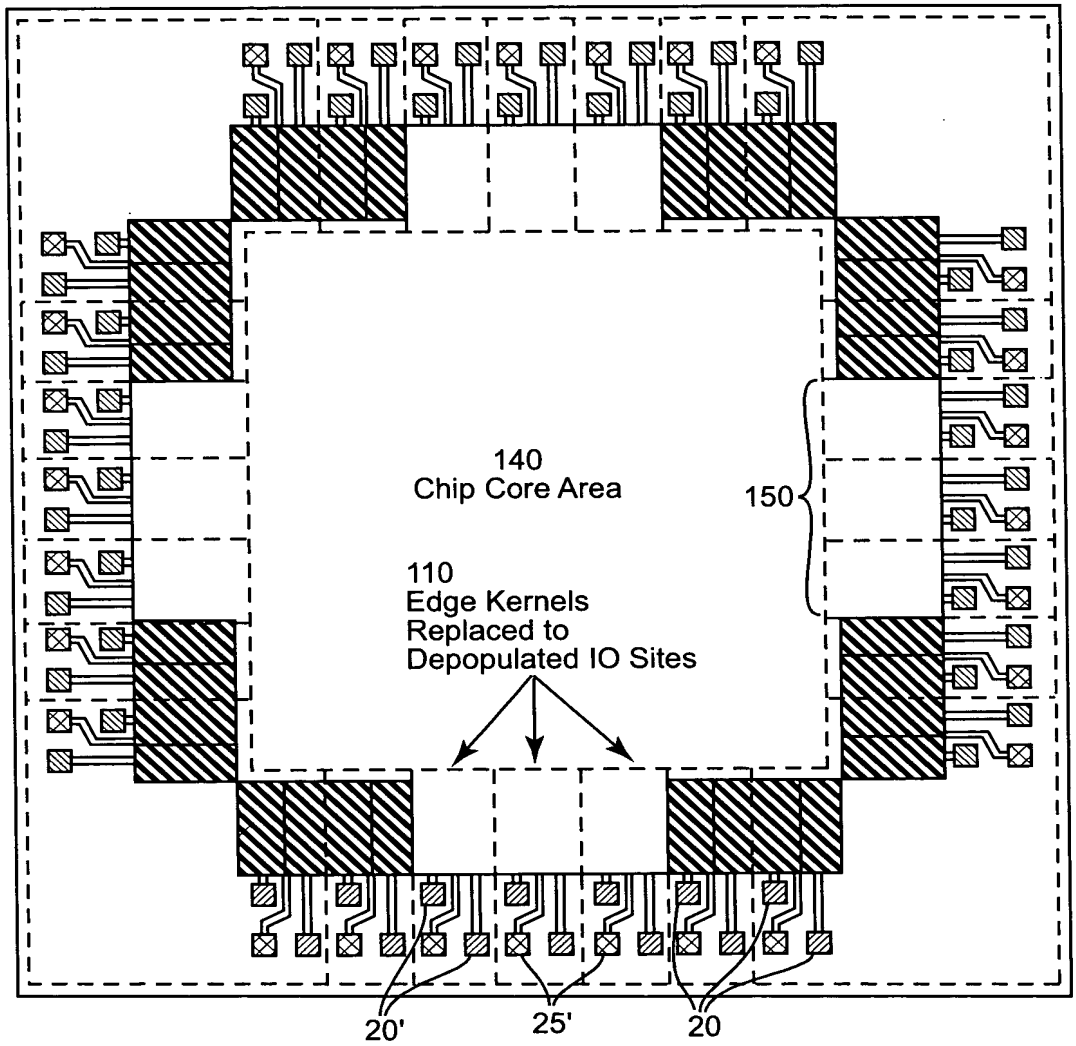
140
Chip Core Area
150
110
Edge Kernels
Replaced to
Depopulated IO Sites
20'
25'
20

Figure 4

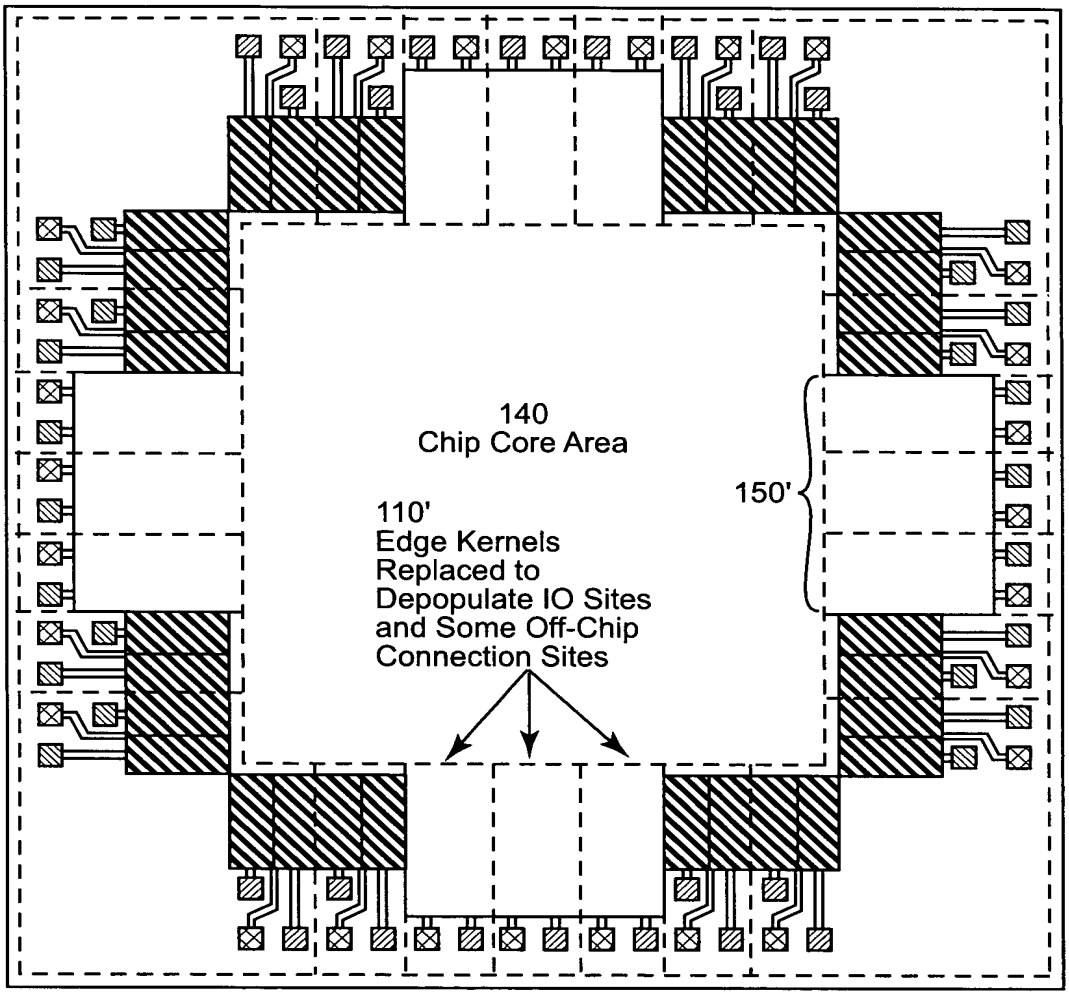
140
Chip Core Area
150'
110'
Edge Kernels
Replaced to
Depopulate IO Sites
and Some Off-Chip
Connection Sites

Figure 5

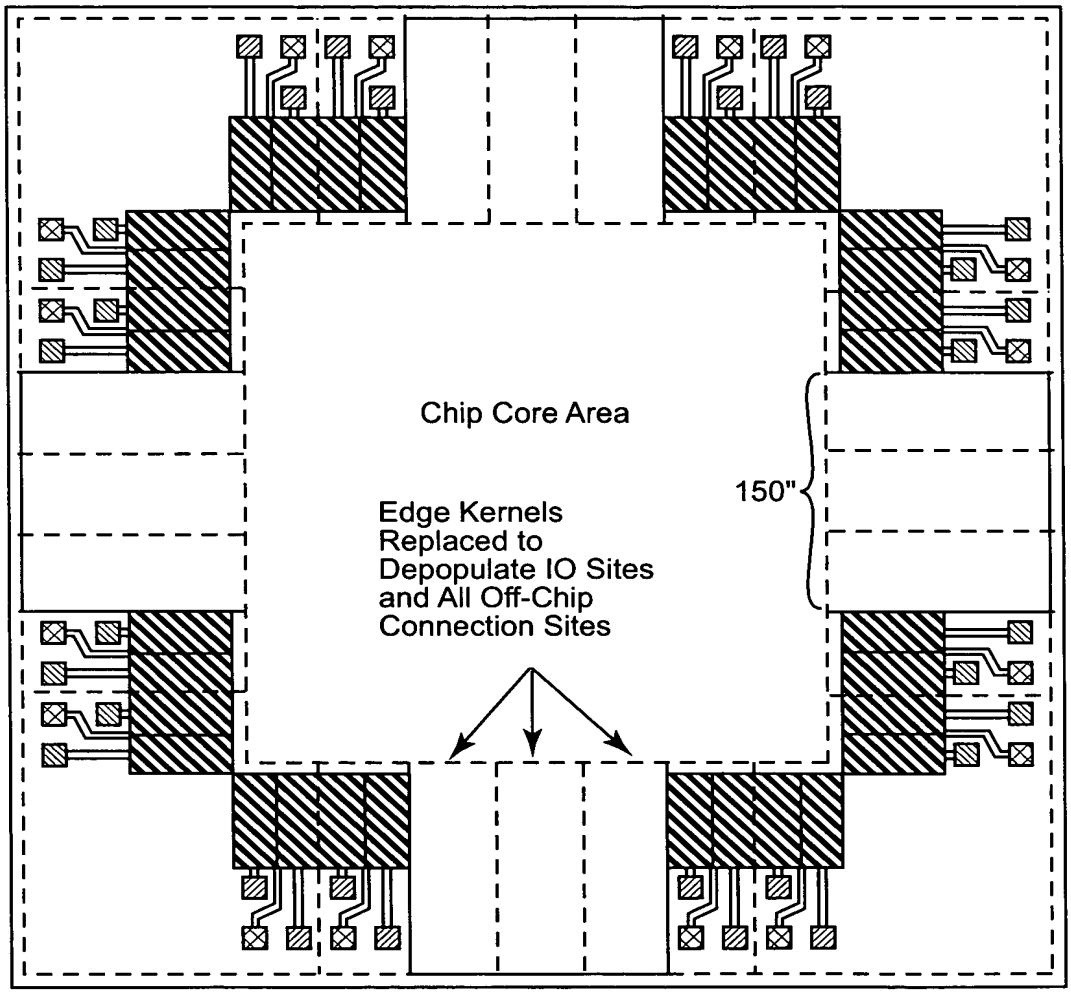
Chip Core Area
150"
Edge Kernels
Replaced to
Depopulate IO Sites
and All Off-Chip
Connection Sites

Figure 5A

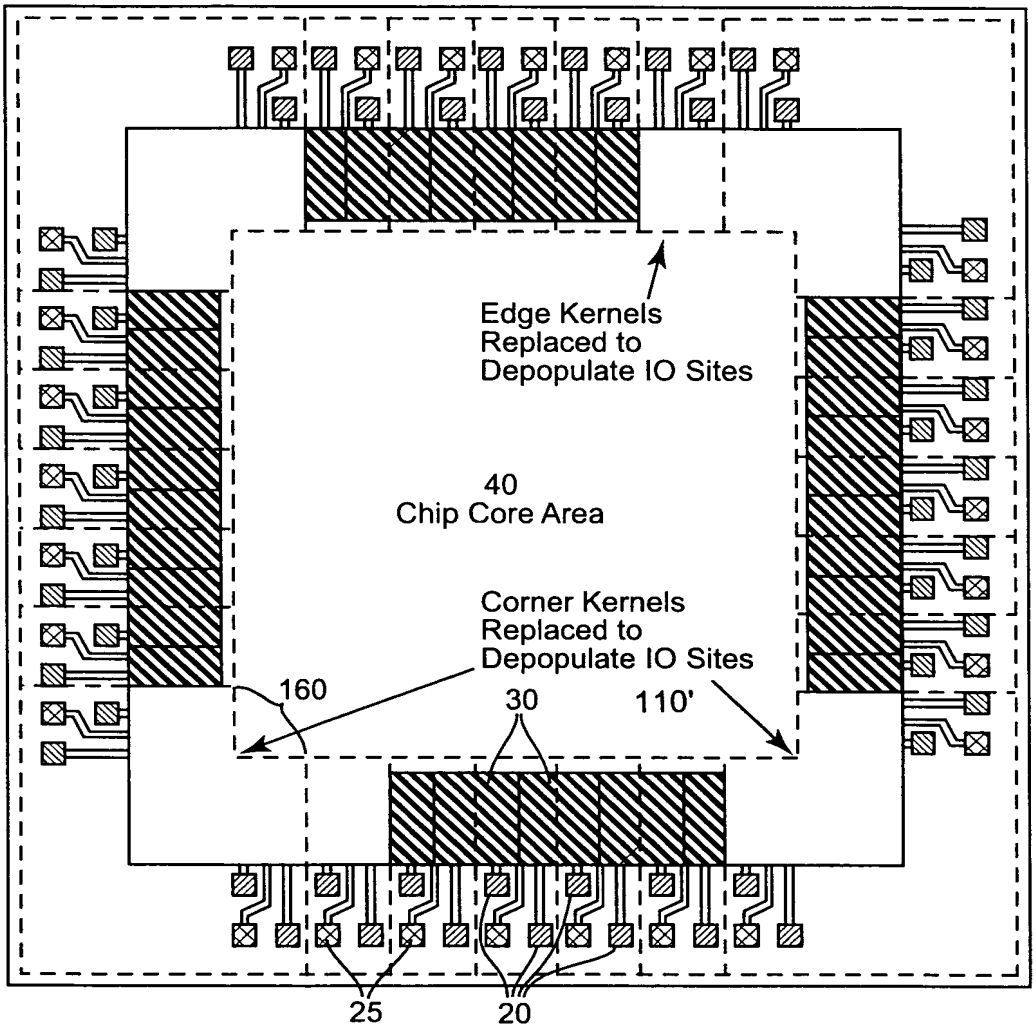
Edge Kernels
Replaced to
Depopulate IO Sites
40
Chip Core Area
Corner Kernels
Replaced to
Depopulate IO Sites
160
30
110'
25
20

Figure 6

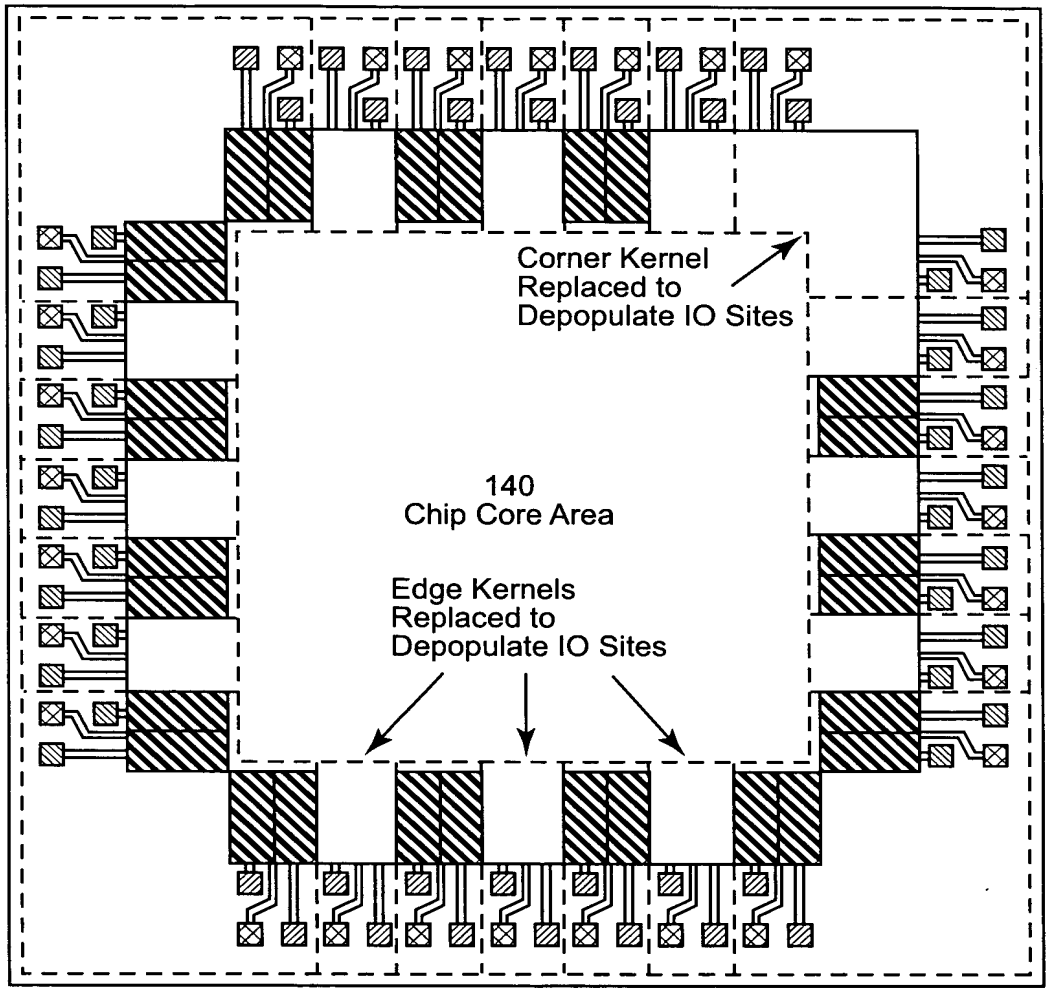
Corner Kernel
Replaced to
Depopulate IO Sites
140
Chip Core Area
Edge Kernels
Replaced to
Depopulate IO Sites

Figure 7

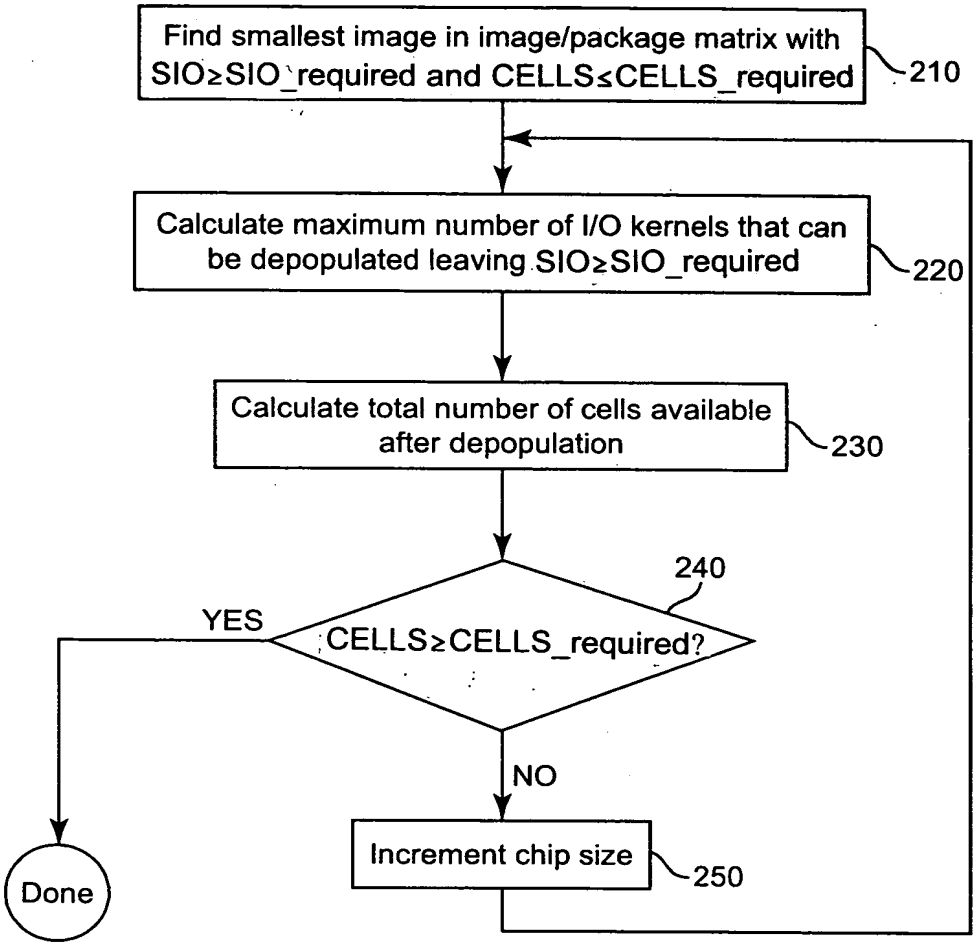
Find smallest image in image/package matrix with SIO≥SIO_required and CELLS≤CELLS_required
210
Calculate maximum number of I/O kernels that can be depopulated leaving SIO≥SIO_required
220
Calculate total number of cells available after depopulation
230
240
CELLS≥CELLS_required?
YES
NO
Increment chip size
250
Done

Figure 8

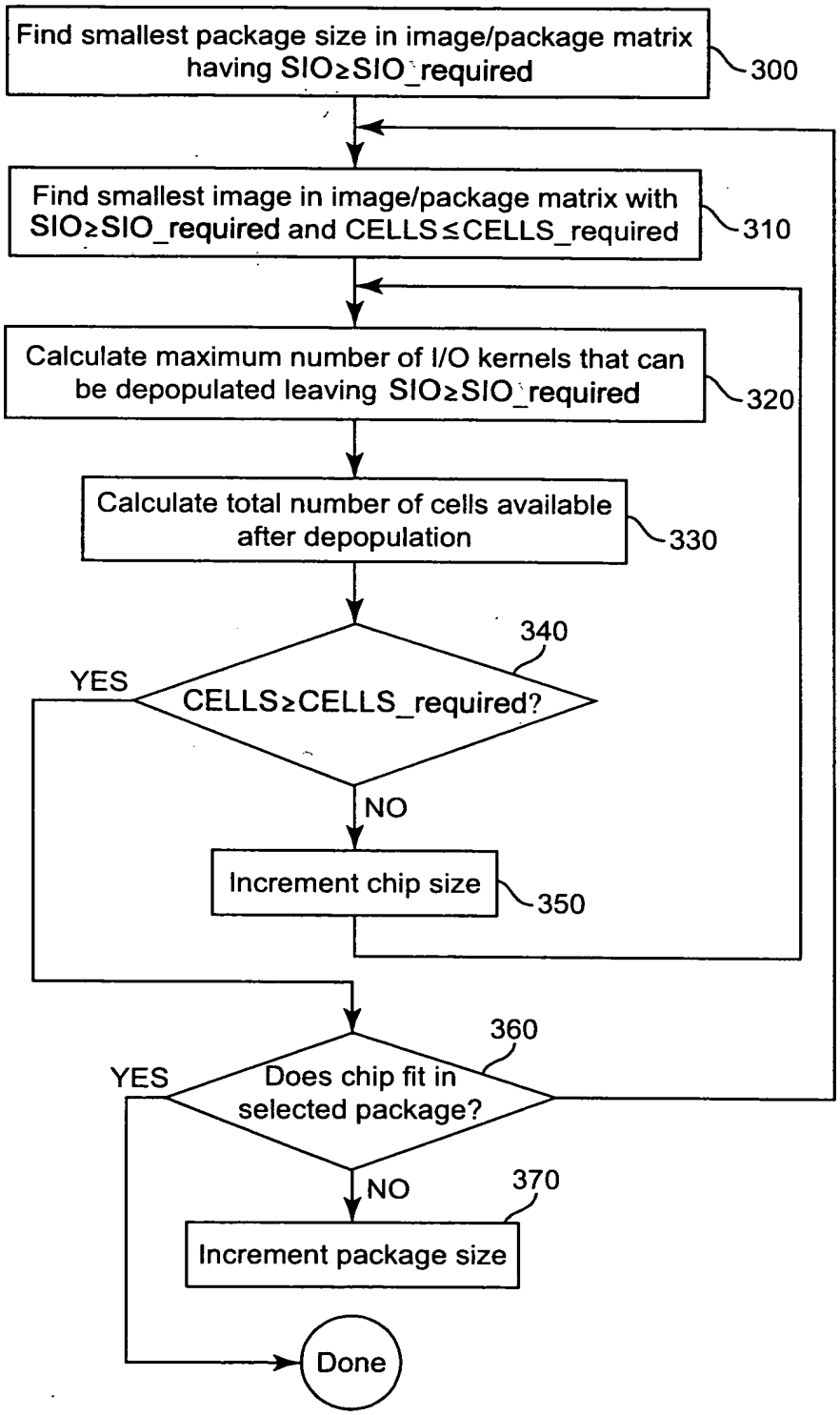
Find smallest package size in image/package matrix having SIO≥SIO_required
300
Find smallest image in image/package matrix with SIO≥SIO_required and CELLS≤CELLS_required
310
Calculate maximum number of I/O kernels that can be depopulated leaving SIO≥SIO_required
320
Calculate total number of cells available after depopulation
330
340
YES
CELLS≥CELLS_required?
NO
Increment chip size
350
360
YES
Does chip fit in selected package?
NO
370
Increment package size
Done

Figure 9

Chip Image	4.85 mm x 4.85 mm	5.58 mm x 5.58 mm	6.30 mm x 6.30 mm
Core Cell Area (dimensions)	3.89 mm x 3.89 mm	4.62 mm x 4.62 mm	5.34 mm x 5.34 mm
Core Cell Area	15.13 mm^2	21.34 mm^2	28.62 mm^2
Total Usable IO cell sites	352	416	480
# of edge kernel (per side)	8	10	12
# of corner kernel (per corner)	1	1	1

Usable IO Sites per Edge Kernel	8
Core Area Recovered by replacing an edge kernel	0.36 mm^2
Usable IO Sites per Corner Kernel	24
Core Area Recovered by replacing a corner kernel	1.0 mm^2

Figure 10